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(71)Applicant : CANON INC

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(72)Inventor : KOBAYASHI TAKASHI
ITO MASAMICHI

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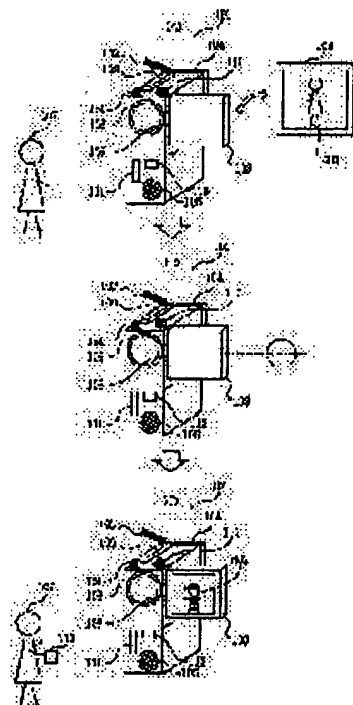
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(54) ELECTRONIC APPARATUS, IMAGING APPARATUS, PORTABLE COMMUNICATIONS APPARATUS, METHOD AND PROGRAM FOR CONTROLLING DISPLAY OF VIDEO

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a display function suitable for a portable communications apparatus having a TV telephone function or a video camera.

SOLUTION: When a video camera is utilized as a TV telephone or a portable telephone is utilized as a TV telephone, the image of an object picked up through a lens is displayed principally on an LCD panel under a state where the direction of the display plane of the LCD panel (display direction) is opposite to the direction of the lens (imaging direction). Under a state where the direction of the display plane of the LCD panel (display direction) is the same as the direction of the lens (imaging direction), an image transmitted from the opposite party is displayed principally on the LCD panel.



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CLAIMS

[Claim(s)]

[Claim 1] A photography means to photo a photographic subject, and the display means which can display the image photoed by said photography means, and the external image received from the outside, While taking a photograph with the movable means of said photography means and said display means to which it carries out movable [of any one] at least, and said photography means Electronic equipment characterized by having the display-control means which changes the image displayed on said display means according to the relative-position relation of said photography means and said display means when said external image is being received.

[Claim 2] It is electronic equipment characterized by said movable means including a rolling mechanism in a part of configuration at least in claim 1.

[Claim 3] It is electronic equipment characterized by displaying said external image received for said display means when it is judged in claim 1 that the bearing of the exposure axis of said photography means and the display direction of said display-control means of said display means correspond.

[Claim 4] It is [sub] electronic equipment characterized by what is ** (ed) and displayed about said image which mainly displayed said external image received for said display means, and was photoed with said photography means when it was judged in claim 3 that the bearing of the exposure axis of said photography means and the display direction of said display-control means of said display means correspond.

[Claim 5] It is electronic equipment characterized by displaying said image photoed with said photography means on said display means when it is judged in claim 1 that the bearing of the exposure axis of said photography means and the display direction of said display-control means of said display means do not correspond.

[Claim 6] It is [sub] electronic equipment characterized by what is ** (ed) and displayed about said external image which mainly displayed said image photoed with said photography means on said display means, and was received when it was judged in claim 5 that the bearing of the exposure axis of said photography means and the display direction of said display-control means of said display means do not correspond.

[Claim 7] A photography means to photo a photographic subject, the receiving means which can receive the video signal from the outside, the photography image photoed with said photography means, and the receiving image received with said receiving means can be displayed. While taking a photograph with a display means by which the sense can be changed and said photography means of a display, including rotation actuation in a part of the actuation at least Image pick-up equipment characterized by having the display-control means which changes the image displayed on said display means according to the sense of said display means when said receiving means is receiving said video signal from the exterior.

[Claim 8] It is image pick-up equipment characterized by for said display means performing rotation actuation centering on some bodies at least in claim 7 using a hinge, and changing the sense of a display.

[Claim 9] It is image pick-up equipment characterized by to display said receiving image on said display

means when it is judged in claim 7 that the sense of a display of said display means and the bearing of the exposure axis of said display-control means of said photography means correspond, and to display said photography image on said display means when it is judged that the sense of a display of said display means and the bearing of the exposure axis of said photography means are not in agreement.

[Claim 10] When it is judged in claim 9 that the sense of a display of said display means and the bearing of the exposure axis of said display-control means of said photography means correspond Said receiving image is mainly displayed on said display means. Said photography image when it is judged that it ** and displays and the sense of a display of said display means and the bearing of the exposure axis of said photography means are not in agreement, [sub] Image pick-up equipment characterized by mainly displaying said photography image on said display means, and sub**(ing) said receiving image and displaying it.

[Claim 11] Image pick-up equipment which has the transmitting means which can be transmitted outside in claim 7 for the video signal further photoed with said photography means, and is characterized by operating said photography means, said receiving means, and said transmitting means to coincidence in a predetermined mode of operation.

[Claim 12] Image pick-up equipment which has an image-processing means to give the image effectiveness further to said photography image, in claim 11, and can express the image processed with said image-processing means as said display means, and is characterized by being ready-for-sending ability with said transmitting means.

[Claim 13] It is image pick-up equipment which has a voice transceiver means to perform transmission and reception of the exterior and a sound signal further, in claim 11, and said predetermined mode of operation is TV phone mode, and is characterized by transmitting and receiving a video signal and a sound signal on real time to an external device in the TV phone mode concerned.

[Claim 14] Image pick-up equipment characterized by outputting the sound signal which has a microphone and a loudspeaker further, transmitted the sound signal which collected the sound with the microphone concerned with said voice transceiver means in claim 13, and was received from said voice transceiver means by the loudspeaker concerned.

[Claim 15] It is image pick-up equipment which has a remote commander for inputting a command from the exterior further in claim 13, and is characterized by equipping the remote commander concerned with the output means or input means of said sound signal.

[Claim 16] A photographic subject is photoed and rotation actuation is included in a part of the actuation at least. A photography means by which bearing of the exposure axis can be changed, While taking a photograph with the display means which can display the transceiver means which can transmit and receive the exterior, a video signal, and a sound signal, the photography image photoed with said photography means, and the receiving image received with said transceiver means, and said photography means Pocket communication equipment characterized by having the display-control means which changes the image displayed on said display means according to the bearing of the exposure axis of said photography means when said transceiver means is performing transmission and reception of the exterior, a video signal, and a sound signal.

[Claim 17] It is the pocket communication equipment characterized by for said photography means performing rotation actuation centering on some bodies at least in claim 16 using a hinge, and changing bearing of the exposure axis.

[Claim 18] It is the pocket communication equipment characterized by to display said receiving image on said display means when it is judged in claim 16 that the sense of a display of said display means and the bearing of the exposure axis of said display-control means of said photography means correspond, and to display said photography image on said display means when it is judged that the sense of a display of said display means and the bearing of the exposure axis of said photography means are not in agreement.

[Claim 19] When it is judged in claim 18 that the sense of a display of said display means and the bearing of the exposure axis of said display-control means of said photography means correspond Said receiving image is mainly displayed on said display means. Said photography image when it is judged

TV
phone
microphone
loudspeaker
remote
commander

that it ** and displays and the sense of a display of said display means and the bearing of the exposure axis of said photography means are not in agreement, [sub] Pocket communication equipment characterized by mainly displaying said photography image on said display means, and sub**(ing) said receiving image and displaying it.

[Claim 20] Pocket communication equipment which has an alphabetic character input means by which the alphabetic character input of arbitration can be performed further, in claim 16, and can express the alphabetic character inputted with said alphabetic character input means as said display means, and is characterized by being ready-for-sending ability as alphabetic data with said transceiver means.

[Claim 21] The photography process which photos a photographic subject using image pick-up equipment, and the receiving process which receives a video signal from the exterior, While taking a photograph at the display process which displays the photography image photoed by the display at said photography process, and the external image received from the outside, and said photography process The display-control approach of the image characterized by having the control process which changes the image displayed at said display process according to the relative physical relationship of the bearing of the exposure axis of said image pick-up equipment, and the sense of a display of said display when said external image is being received at said receiving process.

[Claim 22] The display-control approach of the image characterized by the ability to change any one at least among the bearing of the exposure axis of said image pick-up equipment, and the display direction of said display in claim 21.

[Claim 23] When it is judged in claim 21 that said bearing of the exposure axis and said display direction of said control process correspond It is the display-control approach of the image characterized by controlling to mainly display said external image in said display process, and controlling to mainly display said photography image in said display process when it is judged that said bearing of the exposure axis and said display direction are not in agreement.

[Claim 24] The program characterized by making a computer perform an approach given in claim 21 thru/or any 1 term of 23.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention is used for realizing TV telephone function about image pick-up equipments, such as electronic equipment which can transmit and receive image data and voice data, and a video camera, the pocket communication equipment equipped with the photography section, those graphic display control approaches, and a program, and is suitable.

[0002]

[Description of the Prior Art] Recently, what carried the camera in the pocket communication terminal exists. As the application, it transmits to a friend by E-mail, or the still picture photoed with the camera is used for the standby screen of the liquid crystal display of a self-opportunity, and it is used.

[0003] Moreover, the camera whose data communication with the exterior becomes possible is also considered using the built-in communication facility. An example of this camera (video camera) is shown in drawing 13. In a video camera 301, 303 is the lens section. 304 is a liquid crystal display panel which displays the image picturized through a lens 303. 305 is a trigger carbon button for photography record. 306 is a dc-battery. 307 is an electronic viewfinder. 308 is the data communication section and a radio function with an external system is realized through an antenna 302. Moreover, 309 is various control units.

[0004] If the pocket communication terminal which carried a camera which was mentioned above, and the video camera in which an external communication link is possible are used, it will become possible to realize the so-called TV telephone function which transmits and receives image data and voice data. In this case, it is the use gestalt which displays the camera carried in the pocket communication terminal, and the image which photoed its image with the video camera, and transmitted photography data to the communications partner, and was received from the communications partner on the liquid crystal display of a pocket communication terminal, and the liquid crystal display panel of a video camera.

[0005]

[Problem(s) to be Solved by the Invention] However, when TV telephone function is realized using a pocket communication terminal or a video camera, there is a place which cannot be said to be enough about the user-friendliness. For example, when realizing TV telephone function using a video camera 301, the image always received from the communications partner is displayed on the liquid crystal display panel 304 during a message. With this configuration, although it is good when photoing oneself and sending that image to a communications partner, fixing a video camera, there is a problem of it becoming impossible to use the LCD panel 304 for framing adjustment of photography to send as an image the appearance of the person who is present, for example in a surrounding scene and a surrounding perimeter to a communications partner.

[0006] This invention aims at offering the pocket communication equipment equipped with TV telephone function which is further easy to treat for the purpose of solving the trouble like the above-mentioned, and a video camera.

[0007]

[Means for Solving the Problem] As a means for attaining this purpose, this invention has the means which consists of the following configurations.

[0008] A photography means by which the electronic equipment of this invention photos a photographic subject, and the display means which can display the image photoed by said photography means, and the external image received from the outside, While taking a photograph with the movable means of said photography means and said display means to which it carries out movable [of any one] at least, and said photography means When said external image is being received, it is characterized by having the display-control means which changes the image displayed on said display means according to the relative-position relation of said photography means and said display means.

[0009] Moreover, the image pick-up equipment of this invention can display a photography means to photo a photographic subject, the receiving means which can receive the video signal from the outside, the photography image photoed with said photography means, and the receiving image received with said receiving means. While taking a photograph with a display means by which the sense can be changed and said photography means of a display, including rotation actuation in a part of the actuation at least When said receiving means is receiving said video signal from the exterior, it is characterized by having the display-control means which changes the image displayed on said display means according to the sense of said display means.

[0010] The pocket communication equipment of this invention photos a photographic subject, and rotation actuation is included in a part of the actuation at least. Moreover, a photography means by which bearing of the exposure axis can be changed, While taking a photograph with the display means which can display the transceiver means which can transmit and receive the exterior, a video signal, and a sound signal, the photography image photoed with said photography means, and the receiving image received with said transceiver means, and said photography means When said transceiver means is performing transmission and reception of the exterior, a video signal, and a sound signal, it is characterized by having the display-control means which changes the image displayed on said display means according to the bearing of the exposure axis of said photography means.

[0011] Moreover, the photography process at which the display-control approach of the image of this invention photos a photographic subject using image pick-up equipment, While taking a photograph at the display process which displays the receiving process which receives a video signal from the exterior, the photography image photoed by the display at said photography process, and the external image received from the outside, and said photography process When said external image is being received at said receiving process, it is characterized by having the control process which changes the image displayed at said display process according to the relative physical relationship of the bearing of the exposure axis of said image pick-up equipment, and the sense of a display of said display.

[0012]

[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained to a detail using a drawing.

[0013] (Gestalt 1 of operation) As a gestalt of the 1st operation, the example which applied this invention to image pick-up equipment is explained.

[0014] Drawing which expressed the appearance and use gestalt of a video camera 101 which are image pick-up equipment of the gestalt of this operation to drawing 1 (A), drawing 1 (B), and drawing 2 is shown. By equipping with the modem 102 of the memory card mold in which **** is possible, this video camera 101 can use this as a communication terminal, and can realize TV telephone function. With the modem 102 of a memory card mold, the communication mode which communicates through other telephones which are on a network using the radio method using the telephone lines, such as a pocket message terminal network, Bluetooth which is short-distance radio has available composition directly. *modern Bluetooth*

[0015] Moreover, the video camera 101 consists of the memory card slot 109 for equipping with the hinge 108 for rotating the liquid crystal display panel (LCD panel) 103, a viewfinder 104, the built-in loudspeaker 105, a lens 106, and the LCD panel 103, and the modem 102 of a memory card mold, a trigger carbon button 110 which directs initiation and a halt of photography, a menu switch 111, a built-

in microphone 113, etc.

[0016] Moreover, 107 is a photographic subject.

[0017] With the hinge 108 mentioned above, as shown in drawing 1, the LCD panel 103 can be rotated in the direction of arrow-head R. Moreover, the LCD panel 103 can also be made to open and close, as shown in drawing 1 and drawing 2.

[0018] Moreover, with the menu switch 111, the video camera (VCR) mode in which the usual photography actuation is performed, and TV telephone mode used as a TV telephone can be chosen and determined as a video camera 101. Moreover, as shown in drawing 4, when a menu screen 401 is displayed on the screen of the LCD panel 103, mode selection is performed according to actuation of the menu switch 111 and TV telephone mode is chosen, it has composition in which selection and decision of the telephone number are possible on the menu screen. The telephone number of a communication link place has composition which the user itself can register into the memory in a video camera 101 (218 of drawing 7). Moreover, the number key (ten key) used for the direct input of a number in addition to selection of the telephone number by the menu screen may be prepared in video camera 101 body.

mode
(peter)

[0019] Furthermore, the video camera 101 is equipped with the carbon button 112 for carrying out an on-hook condition (talk state) at the time of the dispatch at the time of TV telephone mode, or arrival, and the carbon button 112 has composition which changes light-and-darkness displays (color of LED etc.) in a message and un-talking over the telephone.

[0020] Moreover, a video camera 101 can also be operated by remote control by the remote controller 150 as shown in drawing 3. The video camera 101 is equipped with the transceiver circuit and antenna 151 for performing wireless transmission and reception of a remote controller 150 and various signals.

[0021] Here, the remote controller 150 of drawing 3 is explained. The remote controller 150 possesses the transceiver antenna 118 for performing wireless transmission and reception of a command key 117, the video camera 101 and sound signal for performing various actuation of a video camera, such as the remote loudspeaker 115, the remote microphone 116, and a carbon button on hook, a trigger carbon button, or various command signals, and the power switch 119 of a remote controller.

[0022] An output of the sound signal received from the video camera 101 is possible, and it has composition which can be transmitted to a video camera 101 from the remote loudspeaker 115 in a remote controller 150 in the sound signal which collected the sound with the remote microphone 116.

[0023] Then, explanation in case a video camera 101 performs the photography actuation usual in VCR mode is performed.

[0024] A user operates the menu switch 111 and changes to VCR mode. Moreover, with the actuation switch of the video camera function which is not illustrated, it is switchable in the camera mode for taking a photograph with the VTR mode for reproducing among VCR modes, and changes to camera mode here.

menu
switch

[0025] And if a lens 106 is turned to a photographic subject 107 and the trigger carbon button 110 is pushed, photography and record will be started. At this time, the image photoed is displayed on the screen or the viewfinder 104 of the LCD panel 103. For example, when the LCD panel 103 is open as are shown in drawing 2, and a photography image is displayed on a viewfinder 104 when the LCD panel 103 is closed, and shown in drawing 1, a photography image is displayed on the screen of the LCD panel 103.

pivotal

[0026] As mentioned above, in the condition that the LCD panel 103 is pivotal as a shaft, and shows a hinge 108 to drawing 1 (A), the sense (the display direction) of the screen of the LCD panel 103 is turned to the viewfinder 104 side used as the sense (bearing of the exposure axis) of a lens 106, and an opposite direction (arrow head 501).

[0027] From this condition, if the LCD panel 103 is rotated about 180 degrees, as shown in drawing 1 (B), the sense (the display direction) of the screen of the LCD panel 103 is turned to the photographic subject 107 side used as the same direction (arrow head 502) as the sense (bearing of the exposure axis) of a lens 106. This condition is called a confrontation photography condition. In the case of a confrontation photography condition, reversal conversion is carried out so that the upper and lower sides may become a reverse image, further, mirror image conversion is carried out and right and left are

displayed so that the image displayed on the LCD panel 103 may not be visible to reverse.

[0028] This confrontation photography is used, when photoing the photography person itself, or when making interest lengthen and making a look turned to a lens 106 side by showing a child the child reflected in the LCD panel 103 itself, when taking a picture of a child.

[0029] Next, the case where TV telephone function is realized using a video camera 101 is explained. In this case, while equipping a memory card slot 109 with the modem 102 of a memory card mold, the menu switch 111 is operated and it changes to TV telephone mode. TV
teleph

[0030] If it changes to TV telephone mode, transmission and reception of the image data and voice data using the telephone line etc. will be attained using the modem 102 of the memory card mold with which it equipped.

[0031] A user is told about that generate a ringer tone, perform an icon display to the screen on the LCD panel 103, or carry out indicating the carbon button 112 by blinking etc., and there is arrival of the mail at the time of telephone arrival. 103^m

[0032] Moreover, the image sent by the message partner is displayed on the screen of the LCD panel 103, and a loudspeaker 105 or the remote loudspeaker 115 to an output is possible for voice.

[0033] When sending an image here, the image photoed from the lens 106 is processed and it is ready-for-sending ability, and about voice, it inputs from a microphone 113 or the remote microphone 116, and is ready-for-sending ability at a partner's communication equipment.

[0034] Since it is necessary to send one's image also to a message partner as a fundamental use gestalt in TV telephone mode, as shown in drawing 5, turn bearing of the exposure axis (arrow head X) in the direction of [one's], coincidence is made to rotate the LCD panel 103, the display direction (arrow head Y) is turned to a himself side, and the screen is fixed in the state of confrontation photography, and it talks over the telephone, look at a message partner's image displayed on the screen.

[0035] Furthermore, in TV telephone mode of the video camera 101 of this operation gestalt, various photography in addition to an above-mentioned fundamental use gestalt and a display are possible. Hereafter, with reference to drawing 6 (A), (B), and (C), the use gestalt in TV telephone mode is explained.

[0036] The condition which shows in drawing 6 (A) is in the condition which turns the sense (the display direction) of the screen of the LCD panel 103 to a sense [of a lens 106] (bearing of the exposure axis), and opposite direction 104, i.e., viewfinder, side, and is carrying out message and photography. It is made for the image displayed on the LCD panel 103 to turn into the image 601 of the photographic subject 107 photoed through the lens 106 in this condition. Moreover, a sound is collected with a microphone 113, neighboring voice is transmitted to a message partner, and the voice which received from the partner is outputted from a loudspeaker 105.

[0037] From the above-mentioned condition, as shown in drawing 6 (B), a hinge 108 is used as the supporting point, and the LCD panel 103 is rotated 180 degrees, as shown in an arrow head.

[0038] And as shown in drawing 6 (C), as a result of rotating the LCD panel 103 about 180 degrees, the direction of the screen of the LCD panel 103 (the display direction) turns into the same direction as the sense (bearing of the exposure axis) of a lens 106. It is made for the image displayed on the LCD panel 103 to turn into the image 602 sent by the message partner in this condition (confrontation photography condition). At this time, a sound is collected with a microphone 113, neighboring voice is transmitted to a message partner, and the voice which received from the partner is outputted from a loudspeaker 105.

[0039] Moreover, it is possible to operate the command key group 117 and to operate ***** of a video camera 101 on hook by remote control under a confrontation photography condition like drawing 6 (C), after a photographic subject 107 turns ON the power switch 119 of a remote controller 150 in the situation (or all situations using a remote controller 150) of operating a video camera 101 using a remote controller 150. Moreover, it is also possible to choose so that the voice of the photographic subject 107 neighborhood which operates a remote controller 150 may be collected with the remote microphone 116 about voice, it may transmit to the antenna 151 of a video camera 101 through a radio transmission from the transceiver antenna 118 and it may transmit to a message partner further. Moreover, it is also possible to choose so that the transceiver antenna 118 of a remote controller 150 may receive the voice

from a message partner through a radio transmission from the antenna 151 of a video camera 101 and it may output from the remote loudspeaker 115.

[0040] As stated above, it is possible to change the image which is made to rotate the LCD panel 103 and is displayed on the LCD panel 103 according to the location (the display direction) to the image photoed for itself [video camera 101] and the image sent by the message partner. That is, the condition which showed in drawing 6 (C) is in the condition of talking over the telephone while showing a face to each other to each other, the condition which showed in drawing 6 (A) is in the condition of sending and showing a message partner the image of the person who is present in his surrounding situation and surrounding near, and framing can be performed while a photography person looks at the image of the LCD panel 103 in this case.

[0041] The block diagram of the video camera 101 of this operation gestalt is shown in drawing 7, and this is explained. In addition, the same sign is given to the same thing as the already explained component.

[0042] 102 is the modem of a memory card mold and is controlled by the communications control circuit 202. 202 is a communications control circuit and performs the setup of the modem 102 of a memory card mold, starting/termination of a communication link connection, transmission and reception of image data or voice data, encoding/decoding for a communication link of an image, etc. according to the directions from CPU203.

[0043] After the image data which received from the communications partner at the time of actuation with TV telephone mode is decoded in the communications control circuit 202, and being changed into the form where it was suitable for the display in the LCD display-control circuit 211, it can be displayed on the LCD panel 103. moreover, the voice data received from the communications partner is sent to a selection circuitry 219 through the communications control circuit 202 -- having -- the built-in loudspeaker 105 -- or pass the transceiver circuit 216 further -- it can output by the remote loudspeaker 115.

[0044] The picture signal picturized with the image sensor 207 through the lens 106 is generated as a camera image by the camera digital disposal circuit 208.

[0045] A camera image can be expressed as the LCD panel 103 through a viewfinder 104 or the LCD display-control circuit 211. Moreover, at the time of TV telephone mode, encoding for a communication link is made in the communications control circuit 202, and a camera image is transmitted outside from a modem 102 at it.

[0046] Furthermore, a camera image, the voice which collected the sound with the built-in microphone 113, or the voice chosen by the selection circuitry 220 among the voice of the remote microphone 116 inputted through the transceiver circuit 216 can be associated, and it can process in the image speech processing circuit 217, and can record in a non-illustrated record circuit. Moreover, in the image speech processing circuit 217, various effect processings can be performed to an image or voice.

[0047] Moreover, at the time of TV telephone mode, the voice chosen by the selection circuitry 220 is transmitted outside through a modem 102 from the communications control circuit 202.

[0048] CPU203 controls each part of a video camera 101. In case the communications control circuit 202 is controlled at the time of TV telephone mode or an effect image is compounded, the image speech processing circuit 217 is controlled by the typical thing. Moreover, although vertical reversal transform processing, mirror image transform processing, etc. are performed about the image displayed by the LCD panel 103 in the LCD display-control circuit 211 when it changes from a normal state to a confrontation condition, this control is also performed by CPU203. In addition, about the display control of the LCD panel at the time of TV telephone mode, detailed explanation is mentioned later.

Furthermore, change control of a selection circuitry 219 and a selection circuitry 220 is performed by CPU203. At this time, CPU203 judges [which is in TV telephone mode / or or] whether the remote controller 150 is used by making a judgment, and changes a selection circuitry 219 and a selection circuitry 220 accommodative according to a situation. In addition, the control action of CPU203 in TV telephone mode is later mentioned using the flow chart of drawing 12.

[0049] Memory 218 stores personal data, such as various processing programs which CPU203 reads,

and the telephone number of a communications partner, etc.

[0050] Moreover, when controllable, CPU203 receives an actuation command from command key group 117 grade, and controls each part by the trigger carbon button 110 which directs photography initiation / termination of a body, the menu switch 111 which changes VCR mode / TV telephone mode, on-hook carbon button which directs initiation/termination of message at time of TV telephone mode 112 grade, and the remote controller 150 based on the received command.

[0051] Then, the actuation at the time of TV telephone mode is explained. The image data picturized with the image sensor 207 through the lens 106 are processed by the camera picture signal for displaying by the screen of a viewfinder 104 or the LCD panel 103 in the camera signal-processing section 208. It is sent to the communications control section 202, encoding processing for reducing the amount of data is performed, and this camera picture signal is transmitted to a message partner with the message voice data which collected the sound with the microphone 113 etc.

[0052] The camera picture signal from the camera signal-processing section 208 and the receiving video signal decoded in the communications control section 202 are inputted into the LCD display-control section 211.

[0053] The installation section of the LCD panel 103 is equipped with the hinge 108 with a rolling mechanism, and the switch 213 which changes according to angle of rotation of the LCD panel 103 is interlocking. There are a contact 214 which detects the location which turned the screen of the LCD panel 103 to the switch 213 the lens 106 side (photographic subject side), and a contact 215 which detects the other location, and these detection result is inputted into CPU203. In addition, a contact 214 and a contact 215 are the configurations of having a predetermined operating range, respectively.

[0054] CPU203 will be controlled to display the receiving image inputted from the communications control section 202 on the screen of the LCD panel 103 to the LCD display-control section 211, if it detects that angle of rotation of the LCD panel 103 is the location (namely, confrontation photography condition) of the contact 214 of a switch 213. At this time, vertical reversal transform processing and mirror image transform processing of a display image are performed in the LCD display-control circuit 211.

[0055] CPU203 will be controlled to the LCD display-control section 211 to display the camera image from the camera signal processing 208 on the screen of the LCD panel 103, if it detects that angle of rotation of the LCD panel 103 is the location (namely, usually photography condition) of the contact 215 of a switch 213 to it.

[0056] Moreover, the image displayed by the LCD panel 103 in TV telephone mode can also be changed like drawing 9 (A) and drawing 9 (B).

[0057] Drawing 9 (A) is the example of a display of the LCD panel 103 in a confrontation photography condition. It is the example which compounds and displays the camera image 902 with the so-called picture in picture gestalt like drawing 9 (A) to the receiving image 901 from a communications partner in the LCD display-control circuit 211. In addition, drawing 9 (A) is an image when compounding a camera image in a receiving image in the display-control circuit 211, considering as the image for a display, performing vertical reversal transform processing and mirror image transform processing to the image for a display further, and seeing the LCD panel 103 from a photographic subject side in the state of confrontation photography. By considering as such a display gestalt, the image received from the message partner on the parent screen in the state of the confrontation photography in TV telephone mode is displayed, and also there is a merit which can adjust its composition etc. by expressing a camera image as a child screen.

[0058] Drawing 9 (B) is usually the example of a display of the LCD panel 103 in a photography condition. It is the example which compounds and displays the receiving image 901 from a communications partner with a picture in picture gestalt like drawing 9 (B) to the camera image 902 in the LCD display-control circuit 211. In the state of photography, the reaction of a communications partner etc. can usually be seen on a child screen, photoing a photographic subject [in / by considering as such a display gestalt / TV telephone mode] showing it as a communications partner, and displaying the camera image as a parent screen.

[0059] Furthermore, the image displayed by the LCD panel 103 in TV telephone mode is also processible like drawing 10 (A) and drawing 10 (B).

[0060] 903 of drawing 10 (A) and drawing 10 (B) is an effect image compounded to the camera image 902. The camera image 902 and the effect image 903 are compounded in the image speech processing section 217. Others and chroma-key composition processing, RUMIKI composition processing, etc. are possible for the synthetic processing performed in the image speech processing section 217 in compounding an alphabetic character (telop), a character, and a camera image. [processing / two or more images / synthetic]

[0061] Like explanation by drawing 9 (A) and drawing 9 (B), in TV telephone mode, drawing 10 (A) can be displayed in a confrontation photography condition, and the effect image 903 and the compounded camera image 902 can usually display [in the image speech processing section 217] drawing 10 (B), respectively at the time of photography mode.

[0062] When a video camera 101 is used as a TV telephone by considering as the above configurations, in talking over the telephone in the state of confrontation photography Both the sense (the display direction) of the screen of the LCD panel 103 and the sense (bearing of the exposure axis) of a lens 106 are turned to their direction. A message partner's image can be displayed all over the LCD panel 103, or the image of a communications partner can be displayed on the parent screen of a picture in picture, and a camera image can be displayed on a child screen.

[0063] In showing a message partner one's surrounding scene and surrounding person to it, while turning to the object which wants to photo a lens 106, the LCD panel 103 can be turned to photography persons, the photoed camera image can be displayed all over the LCD panel 103, or a camera image can be displayed on the parent screen of a picture in picture, and the image from a communications partner can be displayed on a child screen.

[0064] Moreover, since the change of such a display gestalt is being interlocked with easy actuation of rotating the LCD panel 103, it is very user-friendly.

[0065] Then, the actuation in TV telephone mode of a video camera 101 is explained using the flow chart of drawing 12. In addition, the actuation like the flow chart described in drawing 12 can read the processing program memorized by memory 218, and can be performed by CPU203.

[0066] First, in the condition that TV telephone mode is started by menu setup, or it telephones a partner itself, a message is started by changing into a condition on hook the telephone got from the partner (step S1201).

[0067] The sense of the screen of a liquid crystal display is judged in the condition that the message is performed (step S1202).

[0068] If it is usually in a photography condition when the sense of the screen is a BIFAINDA side namely, neighboring voice will be collected using a built-in microphone 113, and the voice from a communications partner will be outputted using the built-in loudspeaker 105 (S1203).

[0069] It judges whether the next, it displays by using as the synthetic image of a camera image and a receiving image the image displayed on the LCD panel 103 (step S1204). Decision here follows directions of a user.

[0070] When it is judged that a synthetic indication is not given at step S1204, only the camera image under photography is displayed (step S1205).

[0071] When it is judged that a synthetic indication is given at step S1204, the camera image under photography is used as a parent screen, it uses the receiving image from a communications partner as a child screen, and it displays by the synthetic image of a picture in picture gestalt (step S1206).

[0072] Moreover, in S1202, if it is in a confrontation photography condition when the sense of the screen is a photographic subject side namely, vertical reversal transform processing and mirror image transform processing will be performed for a camera image and the receiving image from a communications partner (step S1207).

[0073] Subsequently, the power source of a remote controller 150 is turned on, and it judges whether it is during the remote operation by which a command is transmitted and received (step S1208).

[0074] When not operated by remote control, neighboring voice is collected using a built-in microphone

113, and the voice from a communications partner is outputted using the built-in loudspeaker 105 (S1209).

[0075] At step S1208, under the situation of being operated by remote control, voice is collected using the remote microphone 116 installed in the remote controller 150, and, similarly the voice from a communications partner is outputted using the remote loudspeaker 115 (S1210). Moreover, whether a remote microphone and a remote loudspeaker are used may choose according to directions of a user.

[0076] It judges whether the next, it displays by using as the synthetic image of a receiving image and a camera image the image displayed on the LCD panel 103 (step S1211). Decision here follows directions of a user.

[0077] When it is judged that a synthetic indication is not given at step S1211, only the receiving image from a communications partner is displayed (step S1212).

[0078] When it is judged that a synthetic indication is given at step S1211, the receiving image from a communications partner is used as a parent screen, it uses the camera image under photography as a child screen, and it displays by the synthetic image of a picture in picture gestalt (step S1213).

[0079] After being displayed by any of step S1205, step S1206, step S1212, and step S1213 they are, it judges whether it became message termination by cutting a message by itself or the other party (step S1214).

[0080] When the message is not closed, a flow is repeated from step S1202, and when a message is closed, automatic termination of the TV telephone mode is carried out, and it changes to VCR mode (step S1215).

[0081] The flow of drawing 12 is ended above.

[0082] In addition, although the gestalt of this operation explained the case where TV telephone function was realized using the modem and radio of a memory card mold, a communication mode and a gestalt may use not only this but a built-in communication terminal, and even if they are a wire communication, they can realize it similarly. Furthermore, the same function is realizable not only through a telephone but the Internet.

[0083] As mentioned above, as the gestalt 1 of operation described, in TV telephone mode, the change of a display gestalt is possible for the video camera of this invention, and since selection of a display gestalt is being interlocked with easy actuation of rotating the LCD panel 103, it is very user-friendly for a user.

[0084] (Gestalt of the 2nd operation) As a gestalt of the 2nd operation, the example which applied this invention to the pocket mold radio device is explained.

[0085] The cellular phone with a camera which is the pocket mold radio device of the gestalt of this operation is shown in drawing 8 (A) and drawing 8 (B).

[0086] In drawing 8 (A) and drawing 8 (B), 701 is a body of a cellular phone with a camera. 702 is the camera section containing a lens. 703 is the liquid crystal display section with which the body 701 of a cellular phone with a camera is equipped. 707 is a manual operation button (a ten key and menu button).

[0087] In addition, the camera section 702 has composition rotatable in the direction of arrow-head R centering on some bodies 701 by the hinge region 706, and can turn this direction (arrow head 704) ** to an opposite direction (arrow head 705) to the liquid crystal display section 703. Moreover, the camera section 702 may be the configuration which can be detached and attached on a body 701 from a hinge region 706.

[0088] When realizing TV telephone function using the cellular phone constituted as mentioned above, while the camera section 702 is fixed in the direction shown in an arrow head 704 like drawing 8 (A) in TV telephone mode (i.e., when the display direction of the liquid crystal display section 703 and the bearing of the exposure axis of the camera section 702 are in agreement), the receiving image from a communications partner is displayed on the liquid crystal display section 703.

[0089] While fixing in the direction shown in an arrow head 705 like drawing 8 (B) to it (i.e., when the display direction of the liquid crystal display section 703 and the bearing of the exposure axis of the camera section 702 are not in agreement), the image under photography (camera image) is displayed on

the liquid crystal display section 703 in the camera section 702.

[0090] Since it is easily realizable about the principle of operation about the display of the cellular phone in the gestalt 2 of operation from the configuration as the video camera 101 of the gestalt 1 of operation also with the rotation detection of the camera section 702, the actuation of each block of a body 701, and the operating instructions are the same as that of the relation between the bearing of the exposure axis of the lens 106 of the video camera 101 explained with the gestalt 1 of operation, and the display direction of the LCD panel 103, and same using a hinge region 706, and an approach, detailed explanation here omits.

[0091] Moreover, also in the gestalt 2 of operation, modification of a display gestalt can be performed like what was explained to drawing 9 (A) and the drawing 9 (B) list by drawing 10 (A) and drawing 10 (B) in the gestalt 1 of operation.

[0092] Furthermore, in the gestalt 2 of operation, in case a cellular phone with a camera is used as a TV telephone, an alphabetic character input is possible using the manual operation buttons 707 (ten key etc.) provided on a body 701.

[0093] The example of a display of a liquid crystal display 703 is shown in drawing 11 (A) and drawing 11 (B).

[0094] Drawing 11 (A) is an example of a display when the display direction of the liquid crystal display section 703 and the bearing of the exposure axis of the camera section 702 are in agreement, while fixing in the direction which shows the camera section 702 to an arrow head 704 like drawing 8 (A) in TV telephone mode. The receiving image 1001 from a communications partner is given priority to and displayed on the liquid crystal display section 703 in this condition. Although only the receiving image 1001 may be displayed, like drawing 11 (A), a child screen can be used as the camera image 1002 under photography in the camera section 702, and the parent screen of a picture in picture can also be displayed on the receiving image 1001. Furthermore, when performing an alphabetic character input using the ten key of 707 etc., the alphabetic character input screen 1003 can be opened and the alphabetic character and camera image which inputted and inputted the desired alphabetic character can also be transmitted to coincidence at a communications partner.

[0095] Drawing 11 (B) is an example of a display when the display direction of the liquid crystal display section 703 and the bearing of the exposure axis of the camera section 702 are not in agreement, while fixing in the direction which shows the camera section 702 to an arrow head 705 like drawing 8 (B) in TV telephone mode. The camera image 1002 under photography is given priority to and displayed on the liquid crystal display section 703 in the camera section 702 in this condition. Although only the camera image 1002 may be displayed, like drawing 11 (B), the parent screen of a picture in picture can be used as the camera image 1002, a child screen can be used as the receiving image 1001 from a communications partner, and it can also display. Furthermore, when performing an alphabetic character input using the ten key of 707 etc., the alphabetic character input screen 1003 can be opened and the alphabetic character and camera image which inputted and inputted the desired alphabetic character can also be transmitted to coincidence at a communications partner.

[0096] As mentioned above, as the gestalt 2 of operation described, in TV telephone mode, the change of a display gestalt is possible for the cellular phone of this invention, and since selection of a display gestalt is being interlocked with easy actuation of rotating the camera section 702, it is very user-friendly for a user.

[0097] (Gestalt of other operations) So that various kinds of devices may be operated in order to realize the function of the gestalt of operation mentioned above As opposed to the computer in the equipment connected with these various devices, or a system The program code of the software for realizing the function of the gestalt of the above-mentioned implementation is supplied. What was carried out by operating the various above-mentioned devices according to the program stored in the computer (CPU or MPU) of the system or equipment is contained under the category of this invention.

[0098] Moreover, the function of the gestalt of operation which the program code of the above-mentioned software itself mentioned above in this case will be realized, and that program code itself constitutes this invention. The communication media (wire circuits, wireless circuits, etc., such as an

optical fiber) in the computer network (WAN [, such as LAN and the Internet,], radio network, etc.) system for making program information spread as a subcarrier and supplying it as a transmission medium of the program code, can be used.

[0099] Furthermore, the record medium which stored the means for supplying the above-mentioned program code to a computer, for example, this program code, constitutes this invention. As a record medium which memorizes this program code, a flexible disk, a hard disk, an optical disk, a magneto-optic disk, CD-ROM, a magnetic tape, the memory card of a non-volatile, ROM, etc. can be used, for example.

[0100] Moreover, by performing the program code with which the computer was supplied, also when the function of the gestalt of above-mentioned operation is not only realized, but the function of the gestalt of above-mentioned operation is realized in collaboration with OS (operating system) or other application software etc. with which the program code is working in a computer, it cannot be overemphasized that this program code is contained in the gestalt of operation of this invention.

[0101] Furthermore, after stored in the memory with which the functional expansion unit by which the supplied program code was connected to the functional add-in board and the computer of a computer is equipped, also when the function of the gestalt of operation which the CPU with which the functional add-in board and functional expansion unit are equipped based on directions of the program code performed a part or all of actual processing, and mentioned above by the processing is realized, it cannot be overemphasized that it is contained in this invention.

[0102] In addition, it passes over no the configurations and structures of each part which were shown in the gestalt of the above-mentioned implementation to what showed a mere example of the somatization which hits carrying out this invention, and the technical range of this invention must not be restrictively interpreted by these. That is, this invention can be carried out in various forms, without deviating from the pneuma or its main description. For example, with the gestalt of the above-mentioned implementation, although the video camera and the cellular phone were mentioned as the example, if it has the image pick-up section and a display and any those one is made movable, this invention is applicable [it is image data and the device in which voice data transmission and reception are possible, and].

[0103]

[Effect of the Invention] It can be made to function as a user tending to use displays, such as the LCD panel and the liquid crystal display section, by the case where it is used looking at the face of a communications partner to each other according to this invention as explained above, and the case where surrounding situations other than themselves (photography person) and a person's image are mainly sent and shown as a communications partner.

[Translation done.]

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
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TECHNICAL FIELD

[Field of the Invention] This invention is used for realizing TV telephone function about image pick-up equipments, such as electronic equipment which can transmit and receive image data and voice data, and a video camera, the pocket communication equipment equipped with the photography section, those graphic display control approaches, and a program, and is suitable.

[Translation done.]

JAPANESE [JP,2003-158727,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE
INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] It can be made to function as a user tending to use displays, such as the LCD panel and the liquid crystal display section, by the case where it is used looking at the face of a communications partner to each other according to this invention as explained above, and the case where surrounding situations other than themselves (photography person) and a person's image are mainly sent and shown as a communications partner.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, when TV telephone function is realized using a pocket communication terminal or a video camera, there is a place which cannot be said to be enough about the user-friendliness. For example, when realizing TV telephone function using a video camera 301, the image always received from the communications partner is displayed on the liquid crystal display panel 304 during a message. With this configuration, although it is good when photoing oneself and sending that image to a communications partner, fixing a video camera, there is a problem of it becoming impossible to use the LCD panel 304 for framing adjustment of photography to send as an image the appearance of the person who is present, for example in a surrounding scene and a surrounding perimeter to a communications partner.

[0006] This invention aims at offering the pocket communication equipment equipped with TV telephone function which is further easy to treat for the purpose of solving the trouble like the above-mentioned, and a video camera.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] (A) and (B) are drawings showing the appearance and use gestalt of a video camera 101 in the operation gestalt of this invention.

[Drawing 2] It is an external view from the backside of a video camera 101, and is drawing showing the condition of having closed the liquid crystal display panel 103.

[Drawing 3] It is drawing of the remote controller 150 to a video camera 101.

[Drawing 4] It is a screen Fig. in the condition of having displayed menu drawing on the liquid crystal display panel 103.

[Drawing 5] It is drawing showing the fundamental use gestalt at the time of using a video camera 101 as a TV telephone.

[Drawing 6] (A) is drawing showing the use gestalt at the time of using a video camera 101 as a TV telephone, and is drawing when turning the screen of the liquid crystal display panel 103 to a photographic subject and the opposite side and photoing it. (B) is drawing having shown signs that the liquid crystal display panel 103 of a video camera 101 rotated. (C) is drawing showing the use gestalt at the time of using a video camera 101 as a TV telephone, and is drawing when turning the screen of the liquid crystal display panel 103 to a photographic subject side and taking a photograph by remote operation.

[Drawing 7] It is a block diagram showing the configuration of a video camera 101.

[Drawing 8] (A) and (B) are drawings showing the appearance and use gestalt of a pocket mold radio device (cellular phone 701 with a camera) which carried the camera in the operation gestalt of this invention.

[Drawing 9] (A) and (B) are the examples of a display of the liquid crystal display panel 103 at the time of using a video camera 101 as a TV telephone.

[Drawing 10] (A) and (B) are the examples of a display of the liquid crystal display panel 103 at the time of using a video camera 101 as a TV telephone.

[Drawing 11] (A) and (B) are the examples of a display of a liquid crystal display 703 at the time of using the cellular phone 701 with a camera as a TV telephone.

[Drawing 12] It is a flow chart showing the actuation at the time of using a video camera 101 as a TV telephone.

[Drawing 13] It is drawing explaining the example of the conventional video camera which contained communication facility.

[Description of Notations]

101 Video Camera

103 The LCD Panel

106 Lens

107 Photographic Subject

108 Hinge

150 Remote Controller

202 Communications Control Circuit
203 CPU
211 LCD Display-Control Circuit
217 Image Speech Processing Circuit
701 Cellular Phone with Camera
702 Camera Section
703 Liquid Crystal Display Section
901 External Receiving Image
902 Camera Image
1001 External Receiving Image
1002 Camera Image

[Translation done.]

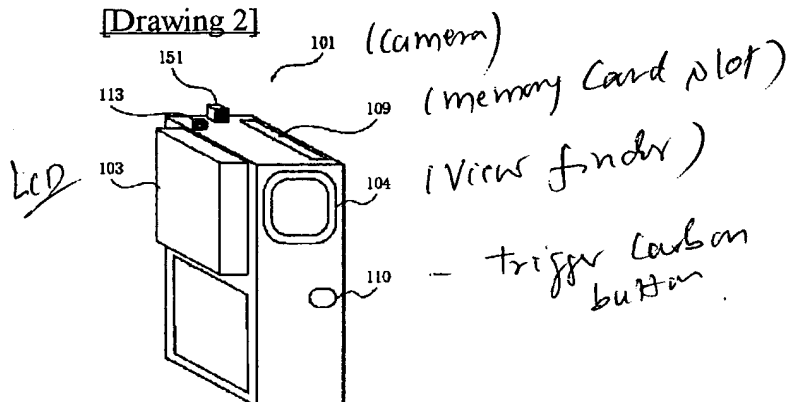
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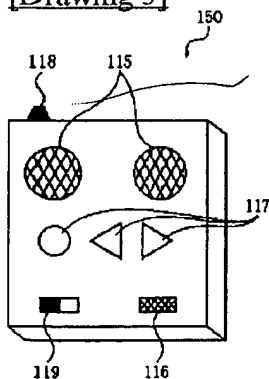
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DRAWINGS

[Drawing 2]



[Drawing 3]



(Remote Controller)

118: antenna

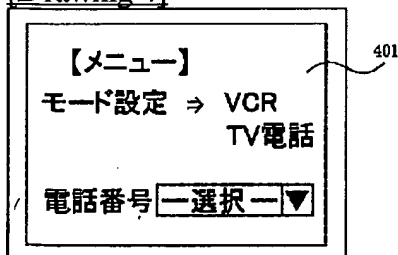
117: command key

115: remote loudspeaker

116: remote microphone

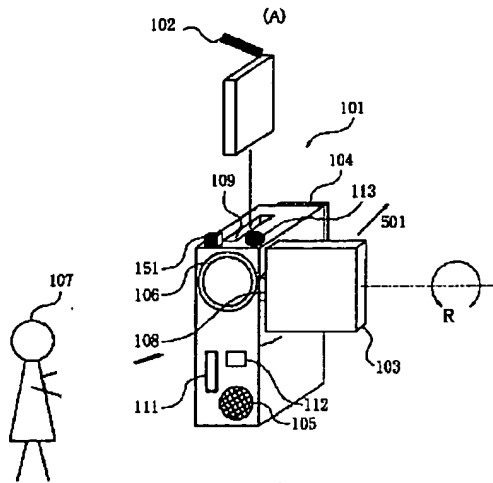
119: power switch

[Drawing 4]



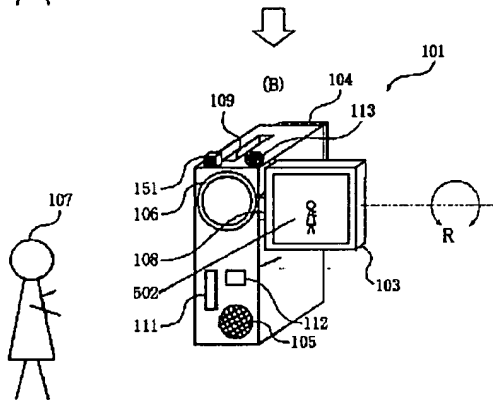
[Drawing 1]

Drawing: 1



102: camera

108: hinge



111: menu switch

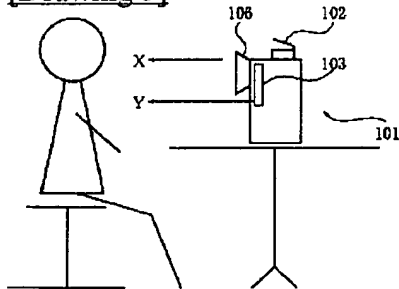
105: loudspeaker

106: lens

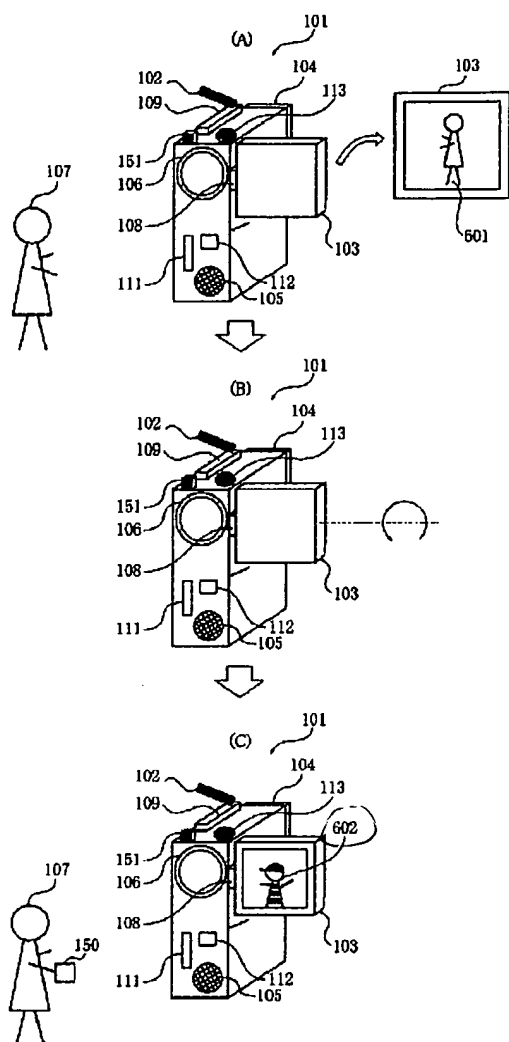
103: LCD

112: carbon button for off-hook condition

[Drawing 5]

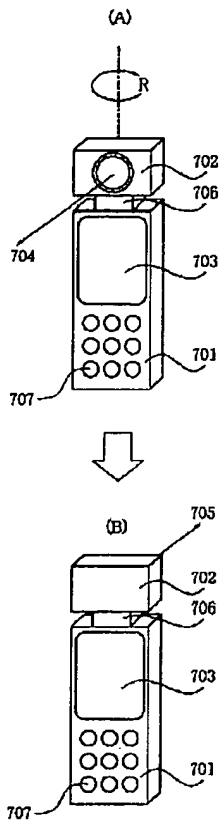


[Drawing 6]

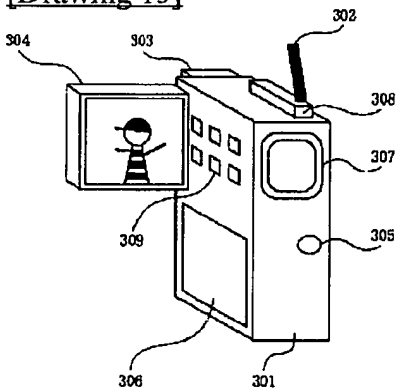


[Drawing 8]

Drawing 8



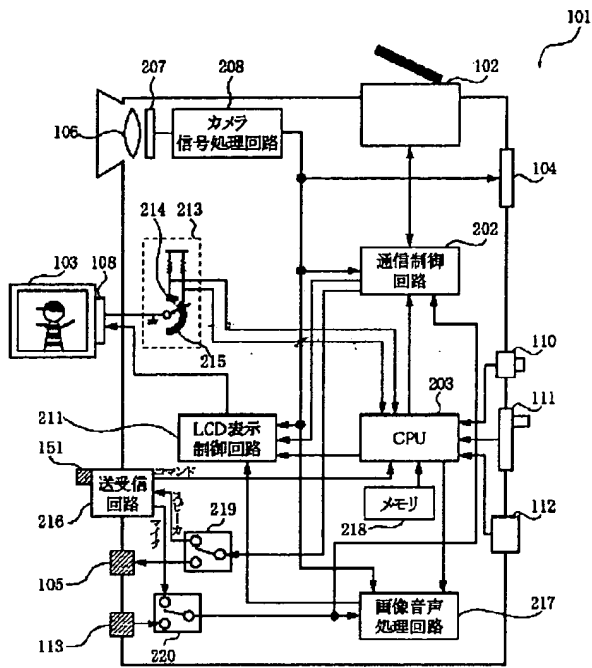
[Drawing 13]



(lenr)

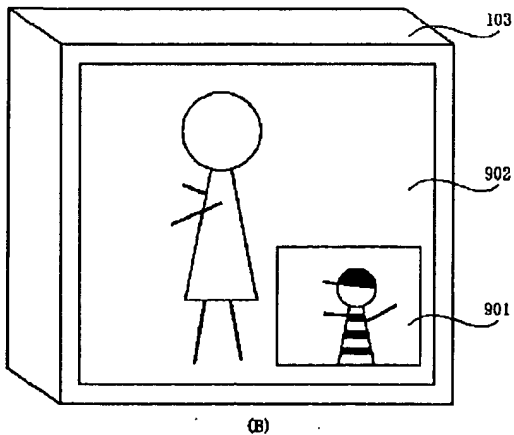
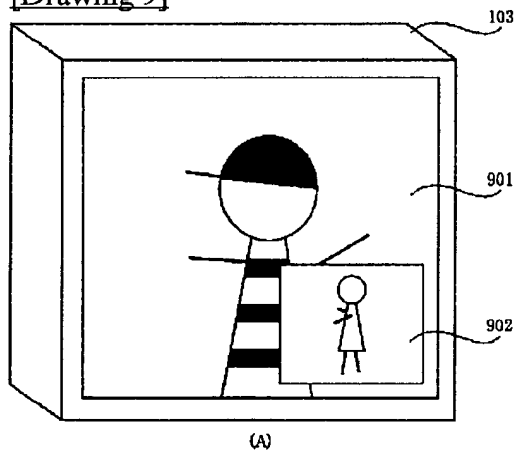
[Drawing 7]

Drawing 7



213: Switch

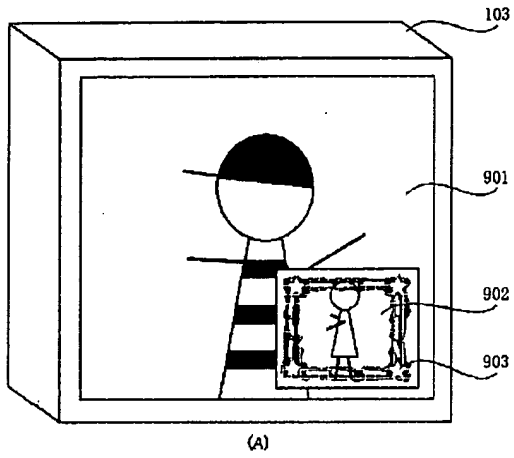
[Drawing 9]



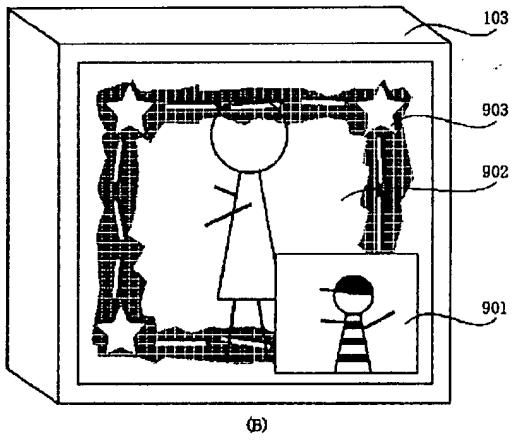
P-in-f

[Drawing 10]

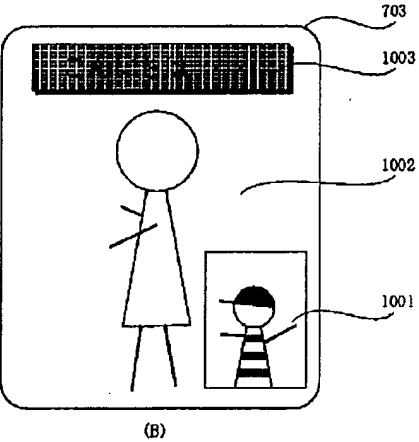
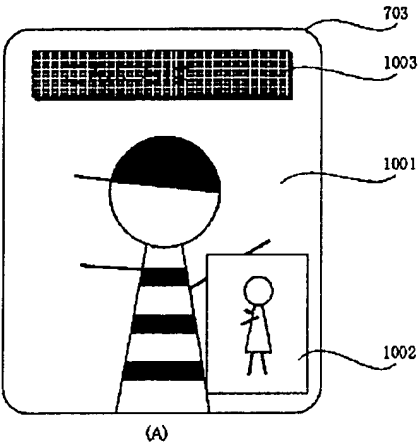
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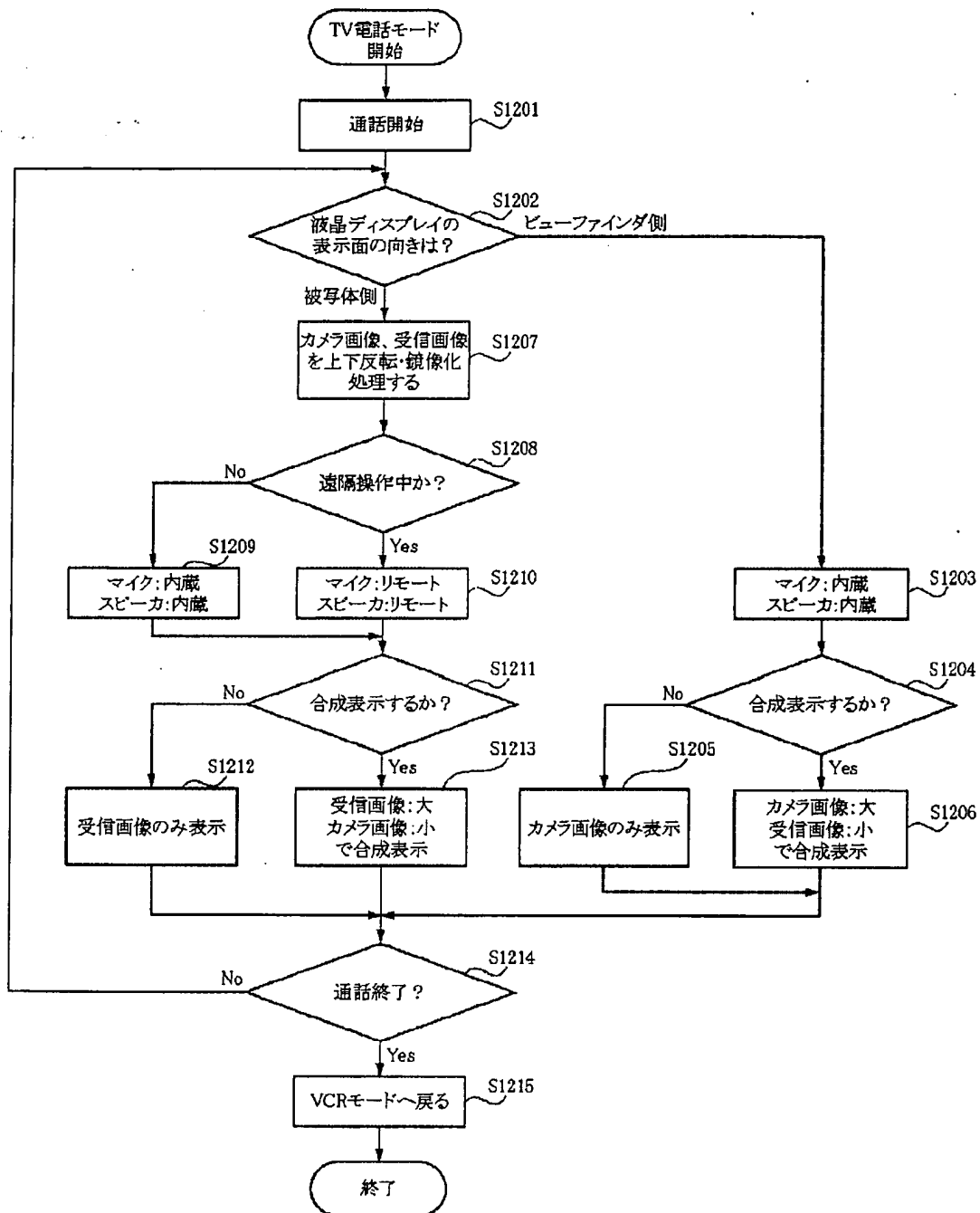
902: camera image
903: effect image



[Drawing 11]



[Drawing 12]



[Translation done.]